Name _____ Class _____ Date _____

Practice 6-4

Solving Systems of Linear Equations Using Substitution

1. Solve the system of equations by substitution.

$$y = 3x - 10$$
$$3x + 2y = 16$$

2. Find the solution to the system of equations by substitution.

$$p = q + 2$$
$$2p + 3q = -26$$

3. Together, teammates Pedro and Ricky got 2,666 base hits last season. Pedro had 276 more hits than Ricky. How many hits did each player have?

4. River C is 100 miles longer than River D. If the sum of their lengths is 5,500 miles, what is the length of each river?

5. **Writing** A seed company planted a floral mosaic of a national flag. The perimeter of the flag is 420 feet.

a) Determine the flag's length and width if the length is 110 feet greater than the width.

b) Write three situations to which you could apply the resulting system of equations.

6. a) **Reasoning** Solve the system of linear equations using substitution.

$$x = 8y - 4$$
$$x + 8y = 6$$

b) Which expression would be easier to substitute into the other equation, in order to solve the problem? Explain your reasoning.

7. **Error Analysis** Tim incorrectly says that the solution of the system of equations is (–9, –4).

$$6g - 2h = -6$$
$$11 = h - 5g$$

a) What is the correct solution?

b) What error might Tim have made?

❍ A. Tim made a mistake calculating the h-value.

❍ B. Tim made a mistake calculating the g-value.

❍ C. Tim switched the values of g and h.

❍ D. Tim used opposite signs for g and h.

8. **Swimming Pool** On a certain hot summer day, 481 people used the public swimming pool. The daily prices are \$1.25 for children and \$2.25 for adults. The receipts for admission totaled \$865.25. How many children and how many adults swam at the public pool that day?

9. **Multiple Representations** You are given the following system of equations.

$$2x - 5y = 26$$
$$x = 3y + 15$$

a) Find the solution of the system of equations by substitution.

b) Draw a picture using algebra tiles to show the substitution.

10. An airplane encountered a head wind during a flight between Joppetown and Jawsburgh, which took 4 hours and 42 minutes. The return flight took 4 hours. If the distance from Joppetown to Jawsburgh is 1400 miles, find the airspeed of the plane (the speed of the plane in still air) and the speed of the wind, assuming both remain constant.

11. **Think About the Process** Consider the following system of equations.

$$\frac{2}{5}r + \frac{5}{2}s = -3$$
$$r = \frac{2}{5}s + \frac{29}{5}$$

a) What should you substitute to solve the system of equations by substitution?

❍ A. Substitute $\frac{2}{5}s + \frac{29}{5}$ for r in the equation $r = \frac{2}{5}s + \frac{29}{5}$.

❍ B. Substitute $\frac{2}{5}s + \frac{29}{5}$ for r in the equation $\frac{2}{5}r + \frac{5}{2}s = -3$.

❍ C. Substitute $\frac{2}{5}r + \frac{29}{5}$ for s in the equation $\frac{2}{5}r + \frac{5}{2}s = -3$.

❍ D. Substitute $\frac{2}{5}r + \frac{29}{5}$ for s in the equation $r = \frac{2}{5}s + \frac{29}{5}$.

b) Solve the system of equations by substitution.

12. **Think About the Process** Tim's piggy bank contains dimes and nickels worth \$5.50. He has 70 coins in all.

a) Let x represent the number of dimes and let y represent the number of nickels. Which system of equations models this problem?

❍ A. $x + y = 70$
$0.10x + 0.05y = 5.50$

❍ B. $x + y = 70$
$0.10y + 0.05x = 5.50$

❍ C. $x + y = 5.50$
$0.10x + 0.05y = 70$

❍ D. $x + y = 5.50$
$0.10y + 0.05x = 70$

b) How many of each coin does Tim have?

Practice 6-4: Solving Systems of Linear Equations Using Substitution

1. (4, 2)
2. (–4, –6)
3. Pedro: 1,471
   Ricky: 1,195
4. River C: 2,800 mi
   River D: 2,700 mi
5. **a)** width: 50 ft
   length: 160 ft
   b) Answers will vary
6. **a)** $\left(1, \frac{5}{8}\right)$
   b) Answers will vary
7. **a)** (–4, –9)
   b) C
8. children: 217
   adults: 264
9. **a)** $(3, -4)$
   b) Answers will vary
10. Speed of plane: 323.9 mph,
    Speed of wind: 26.1 mph
11. **a)** B
    b) $(5, -2)$
12. **a)** A
    b) 40 dimes, 30 nickels